SEQUENCE LISTING

<110> The Regents of the University of California
       Whistler, Jennifer L

<120> METHODS AND COMPOSITIONS FOR MODULATING AGONIST-INDUCED DOWNREGULATION
OF G PROTEIN-COUPLED RECEPTORS

<130> 316E-001510US

<140> US 10/622,373
<141> 2003-07-18

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<170> PatentIn version 3.1

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Gly Gly Ala Glu Ile Glu Asn Asp Val Pro Leu Val Val Arg Pro Lys
        35                  40                  45
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Ser Lys Val Met Pro Gly Ala Ser Thr Lys Val Glu Thr Ser Ala Val
65              70              75              80

Gly Gly Ala Arg Pro Lys Ser Lys Ala Lys Ala Ile Pro Val Ser Arg
                85              90              95

Phe Lys Glu Glu Ala Gln Met Trp Ala Gln Pro Arg Phe Gly Ala Glu
            100             105             110

Arg Leu Ser Lys Thr Glu Arg Asn Ser Gln Thr Asn Ile Ile Ala Ser
        115             120             125

Pro Leu Val Ser Thr Asp Ser Val Leu Val Ala Lys Thr Lys Tyr Leu
    130             135             140

Ser Glu Asp Arg Glu Leu Val Asn Thr Asp Thr Glu Ser Phe Pro Arg
145             150             155             160

Arg Lys Ala His Tyr Gln Ala Gly Phe Gln Pro Ser Phe Arg Ser Lys
            165             170             175

Glu Glu Thr Asn Met Gly Ser Trp Cys Cys Pro Arg Pro Thr Ser Lys
        180             185             190

Gln Glu Ala Ser Pro Asn Ser Asp Phe Lys Trp Val Asp Lys Ser Val
        195             200             205

Ser Ser Leu Phe Trp Ser Gly Asp Glu Val Thr Ala Lys Phe His Pro
210             215             220

Gly Asn Arg Val Lys Asp Ser Asn Arg Ser Met His Met Ala Asn Gln
225             230             235             240

Glu Ala Asn Thr Met Ser Arg Ser Gln Thr Asn Gln Glu Leu Tyr Ile
            245             250             255

Ala Ser Ser Ser Gly Ser Glu Asp Glu Ser Val Lys Thr Pro Trp Phe
        260             265             270

Trp Ala Arg Asp Lys Thr Asn Thr Trp Ser Gly Pro Arg Glu Asp Pro
    275             280             285

Asn Ser Arg Ser Arg Phe Arg Ser Lys Lys Glu Val Tyr Val Glu Ser
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Ser Ser Gly Ser Glu His Glu Asp His Leu Glu Ser Trp Phe Gly Ala
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Gly Lys Glu Gly Lys Phe Arg Ser Lys Met Arg Ala Gly Lys Glu Ala
                325             330             335

Asn Asn Arg Ala Arg His Arg Ala Lys Arg Glu Ala Cys Ile Asp Phe
            340             345             350

Met Pro Gly Ser Ile Asp Val Ile Lys Lys Glu Ser Cys Phe Trp Pro
            355             360             365

Glu Glu Asn Ala Asn Thr Phe Ser Arg Pro Met Ile Lys Lys Glu Ala
    370             375             380

Arg Ala Arg Ala Met Thr Lys Glu Glu Ala Lys Thr Lys Ala Arg Ala
385                 390             395             400

Arg Ala Lys Gln Glu Ala Arg Ser Glu Glu Glu Ala Leu Ile Gly Thr
                405             410             415

Trp Phe Trp Ala Thr Asp Glu Ser Ser Met Ala Asp Glu Ala Ser Ile
            420             425             430

Glu Ser Ser Leu Gln Val Glu Asp Glu Ser Ile Ile Gly Ser Trp Phe
        435             440             445

Trp Thr Glu Glu Glu Ala Ser Met Gly Thr Gly Ala Ser Ser Lys Ser
    450             455             460

Arg Pro Arg Thr Asp Gly Glu Arg Ile Gly Asp Ser Leu Phe Gly Ala
465             470             475             480

Arg Glu Lys Thr Ser Met Lys Thr Gly Ala Glu Ala Thr Ser Glu Ser
            485             490             495

Ile Leu Ala Ala Asp Asp Glu Gln Val Ile Ile Gly Ser Trp Phe Trp
            500             505             510

Ala Gly Glu Glu Val Asn Gln Glu Ala Glu Glu Glu Thr Ile Phe Gly
        515             520             525

Ser Trp Phe Trp Val Ile Asp Ala Ala Ser Val Glu Ser Gly Val Gly
    530             535             540
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Val Ser Cys Glu Ser Arg Thr Arg Ser Glu Glu Glu Val Ile Gly
545             550             555             560

Pro Trp Phe Trp Ser Gly Glu Gln Val Asp Ile Glu Ala Gly Ile Gly
                565             570             575

Glu Glu Ala Arg Pro Gly Ala Glu Glu Thr Ile Phe Gly Ser Trp
            580             585             590

Phe Trp Ala Glu Asn Gln Thr Tyr Met Asp Cys Arg Ala Glu Thr Ser
        595             600             605

Cys Asp Thr Met Gln Gly Ala Glu Glu Glu Pro Ile Ile Gly Ser
    610             615             620

Trp Phe Trp Thr Arg Val Glu Ala Cys Val Glu Gly Asp Val Asn Ser
625             630             635             640

Lys Ser Ser Leu Glu Asp Lys Glu Glu Ala Met Ile Pro Cys Phe Gly
            645             650             655

Ala Lys Glu Glu Val Ser Met Lys His Gly Thr Gly Val Arg Cys Arg
            660             665             670

Phe Met Ala Gly Ala Glu Glu Thr Asn Asn Lys Ser Cys Phe Trp Ala
    675             680             685

Glu Lys Glu Pro Cys Met Tyr Pro Ala Gly Gly Gly Ser Trp Lys Ser
    690             695             700

Arg Pro Glu Glu Glu Glu Asp Ile Val Asn Ser Trp Phe Trp Ser Arg
705             710             715             720

Lys Tyr Thr Lys Pro Glu Ala Ile Ile Gly Ser Trp Leu Trp Ala Thr
            725             730             735

Glu Glu Ser Asn Ile Asp Gly Thr Gly Glu Lys Ala Lys Leu Leu Thr
            740             745             750

Glu Glu Glu Thr Ile Ile Asn Ser Trp Phe Trp Lys Glu Asp Glu Ala
        755             760             765

Ile Ser Glu Ala Thr Asp Arg Glu Glu Ser Arg Pro Glu Ala Glu Glu
    770             775             780
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Gly Asp Ile Val Gly Ser Trp Phe Trp Ala Gly Glu Glu Asp Arg Leu
785             790         795                 800


Glu Pro Ala Ala Glu Thr Arg Glu Glu Asp Arg Leu Ala Ala Glu Lys
            805             810                 815


Glu Gly Ile Val Gly Ser Trp Phe Gly Ala Arg Glu Glu Thr Ile Arg
        820             825                 830


Arg Glu Ala Gly Ser Cys Ser Lys Ser Ser Pro Lys Ala Glu Glu Glu
        835             840             845


Glu Val Ile Ile Gly Ser Trp Phe Trp Glu Glu Glu Ala Ser Pro Glu
    850             855             860


Ala Val Ala Gly Val Gly Phe Glu Ser Lys Pro Gly Thr Glu Glu Glu
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Glu Ile Thr Val Gly Ser Trp Phe Trp Pro Glu Glu Glu Ala Ser Ile
            885             890             895


Gln Ala Gly Ser Gln Ala Val Glu Glu Met Glu Ser Glu Thr Glu Glu
        900             905             910


Glu Thr Ile Phe Gly Ser Trp Phe Trp Asp Gly Lys Glu Val Ser Glu
    915             920             925


Glu Ala Gly Pro Cys Cys Val Ser Lys Pro Glu Asp Asp Glu Glu Met
    930             935             940


Ile Val Glu Ser Trp Phe Trp Ser Arg Asp Lys Ala Ile Lys Glu Thr
945             950             955                 960


Gly Thr Val Ala Thr Cys Glu Ser Lys Pro Glu Asn Glu Glu Gly Ala
            965             970             975


Ile Val Gly Ser Trp Phe Glu Ala Glu Asp Glu Val Asp Asn Arg Thr
        980             985             990


Asp Asn Gly Ser Asn Cys Gly Ser  Arg Thr Leu Ala Asp  Glu Asp Glu
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Ala Ile  Val Gly Ser Trp Phe  Trp Ala Gly Asp Glu  Ala His Phe
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Glu Ser Asn Pro Ser Pro Val Phe Arg Ala Ile Cys Arg Ser Thr
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Cys Ser Val Glu Gln Glu Pro Asp Pro Ser Arg Arg Pro Gln Ser
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Trp Glu Glu Val Thr Val Gln Phe Lys Pro Gly Pro Trp Gly Arg
    1055            1060            1065


Val Gly Phe Pro Ser Ile Ser Pro Phe Arg Phe Pro Lys Glu Ala
    1070            1075            1080


Ala Ser Leu Phe Cys Glu Met Phe Gly Gly Lys Pro Arg Asn Met
    1085            1090            1095


Val Leu Ser Pro Glu Gly Glu Asp Gln Glu Ser Leu Leu Gln Pro
    1100            1105            1110


Asp Gln Pro Ser Pro Glu Phe Pro Phe Gln Tyr Asp Pro Ser Tyr
    1115            1120            1125


Arg Ser Val Gln Glu Ile Arg Glu His Leu Arg Ala Lys Glu Ser
    1130            1135            1140


Thr Glu Pro Glu Ser Ser Ser Cys Asn Cys Ile Gln Cys Glu Leu
    1145            1150            1155


Lys Ile Gly Ser Glu Glu Phe Glu Glu Leu Leu Leu Leu Met Glu
    1160            1165            1170


Lys Ile Arg Asp Pro Phe Ile His Glu Ile Ser Lys Ile Ala Met
    1175            1180            1185


Gly Met Arg Ser Ala Ser Gln Phe Thr Arg Asp Phe Ile Arg Asp
    1190            1195            1200


Ser Gly Val Val Ser Leu Ile Glu Thr Leu Leu Asn Tyr Pro Ser
    1205            1210            1215


Ser Arg Val Arg Thr Ser Phe Leu Glu Asn Met Ile Arg Met Ala
    1220            1225            1230


Pro Pro Tyr Pro Asn Leu Asn Ile Ile Gln Thr Tyr Ile Cys Lys
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Val Cys Glu Glu Thr Leu Ala Tyr Ser Val Asp Ser Pro Glu Gln
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|Leu Ser Gly Ile Arg Met Ile Arg His Leu Thr Thr Thr Thr Asp
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Tyr His Thr Leu Val Ala Asn Tyr Met Ser Gly Phe Leu Ser Leu
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Leu Ala Thr Gly Asn Ala Lys Thr Arg Phe His Val Leu Lys Met
       1295   1300   1305

Leu Leu Asn Leu Ser Glu Asn Leu Phe Met Thr Lys Glu Leu Leu
       1310   1315   1320

Ser Ala Glu Ala Val Ser Glu Phe Ile Gly Leu Phe Asn Arg Glu
       1325   1330   1335

Glu Thr Asn Asp Asn Ile Gln Ile Val Leu Ala Ile Phe Glu Asn
       1340   1345   1350

Ile Gly Asn Asn Ile Lys Lys Glu Thr Val Phe Ser Asp Asp Asp
       1355   1360   1365

Phe Asn Ile Glu Pro Leu Ile Ser Ala Phe His Lys Val Glu Lys
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Phe Ala Lys Glu Leu Gln Gly Lys Thr Asp Asn Gln Asn Asp Pro
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Glu Gly Asp Gln Glu Asn
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Ser Leu Arg Arg Pro Arg Gln Ala Thr Thr Arg Glu Arg Val Thr Ala
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Cys Gly Arg Gln Glu Pro Gln Asn Ser Ala Arg Ile Arg Gln Asn Thr
            20                  25                  30


Arg Glu His Pro Ser Thr Ala Asn Thr Val Asp Arg Thr Asn His Gln
        35                  40                  45


Leu Glu Asn Leu Glu Ala Glu Thr Ala Pro Leu Pro
    50                  55                  60


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            20   25   30

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        35   40   45

Arg Pro Lys Thr Glu Thr Lys Ser Val Pro Ala Ala Arg Pro Lys Thr
    50   55   60

Glu Ala Gln Ala Met Ser Gly Ala Arg Pro Lys Thr Glu Val Gln Val
65   70   75   80

Met Gly Gly Ala Arg Pro Lys Thr Glu Ala Gln Gly Ile Thr Gly Ala
                85   90   95

Arg Pro Lys Thr Asp Ala Arg Ala Val Gly Gly Ala Arg Ser Lys Thr
            100   105   110

Asp Ala Lys Ala Ile Pro Gly Ala Arg Pro Lys Asp Glu Ala Gln Ala
            115   120   125

Trp Ala Gln Ser Glu Phe Gly Thr Glu Ala Val Ser Gln Ala Glu Gly
    130   135   140

Val Ser Gln Thr Asn Ala Val Ala Trp Pro Leu Ala Thr Ala Glu Ser
145   150   155   160

Gly Ser Val Thr Lys Ser Lys Gly Leu Ser Met Asp Arg Glu Leu Val
                165   170   175

Asn Val Asp Ala Glu Thr Phe Pro Gly Thr Gln Gly Gln Lys Gly Ile
            180   185   190

Gln Pro Trp Phe Gly Pro Gly Glu Glu Thr Asn Met Gly Ser Trp Cys
        195   200   205

Tyr Ser Arg Pro Arg Ala Arg Glu Glu Ala Ser Asn Glu Ser Gly Phe
210   215   220

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Trp Ser Ala Asp Glu Thr Ser Thr Ala Ser Ser Phe Trp Thr Gly Glu
225             230             235             240


Glu Thr Ser Val Arg Ser Trp Pro Arg Glu Glu Ser Asn Thr Arg Ser
            245             250                 255


Arg His Arg Ala Lys His Gln Thr Asn Pro Arg Ser Arg Pro Arg Ser
            260                 265                 270


Lys Gln Glu Ala Tyr Val Asp Ser Trp Ser Gly Ser Glu Asp Glu Ala
        275             280             285


Ser Asn Pro Phe Ser Phe Trp Val Gly Glu Asn Thr Asn Asn Leu Phe
    290             295                 300


Arg Pro Arg Val Arg Glu Glu Ala Asn Ile Arg Ser Lys Leu Arg Thr
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Asn Arg Glu Asp Cys Phe Glu Ser Glu Ser Glu Asp Glu Phe Tyr Lys
            325             330                 335


Gln Ser Trp Val Leu Pro Gly Glu Glu Ala Asn Ser Arg Phe Arg His
            340             345                 350


Arg Asp Lys Glu Asp Pro Asn Thr Ala Leu Lys Leu Arg Ala Gln Lys
        355             360             365


Asp Val Asp Ser Asp Arg Val Lys Gln Glu Pro Arg Phe Glu Glu Glu
    370             375             380


Val Ile Ile Gly Ser Trp Phe Trp Ala Glu Lys Glu Ala Ser Leu Glu
385             390             395             400


Gly Gly Ala Ser Ala Ile Cys Glu Ser Glu Pro Gly Thr Glu Glu Gly
            405             410             415


Ala Ile Gly Gly Ser Ala Tyr Trp Ala Glu Glu Lys Ser Ser Leu Gly
        420             425             430


Ala Val Ala Arg Glu Glu Ala Lys Pro Glu Ser Glu Glu Ala Ile
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Phe Gly Ser Trp Phe Trp Asp Arg Asp Glu Ala Cys Phe Asp Leu Asn
450             455             460
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Pro Cys Pro Val Tyr Lys Val Ser Asp Arg Phe Arg Asp Ala Ala Glu
465                 470             475             480

Glu Leu Asn Ala Ser Ser Arg Pro Gln Thr Trp Asp Glu Val Thr Val
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Glu Phe Lys Pro Gly Leu Phe His Gly Val Gly Phe Arg Ser Thr Ser
            500             505             510

Pro Phe Gly Ile Pro Glu Glu Ala Ser Glu Met Leu Glu Ala Lys Pro
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Lys Asn Leu Glu Leu Ser Pro Glu Gly Glu Glu Gln Glu Ser Leu Leu
    530             535             540

Gln Pro Asp Gln Pro Ser Pro Glu Phe Thr Phe Gln Tyr Asp Pro Ser
545             550             555             560

Tyr Arg Ser Val Arg Glu Ile Arg Glu His Leu Arg Ala Arg Glu Ser
            565             570             575

Ala Glu Ser Glu Ser Trp Ser Cys Ser Cys Ile Gln Cys Glu Leu Lys
            580             585             590

Ile Gly Ser Glu Glu Phe Glu Glu Phe Leu Leu Leu Met Asp Lys Ile
    595             600             605

Arg Asp Pro Phe Ile His Glu Ile Ser Lys Ile Ala Met Gly Met Arg
    610             615             620

Ser Ala Ser Gln Phe Thr Arg Asp Phe Ile Arg Asp Ser Gly Val Val
625             630             635             640

Ser Leu Ile Glu Thr Leu Leu Asn Tyr Pro Ser Ser Arg Val Arg Thr
            645             650             655

Ser Phe Leu Glu Asn Met Ile His Met Ala Pro Pro Tyr Pro Asn Leu
            660             665             670

Asn Met Ile Glu Thr Phe Ile Cys Gln Val Cys Glu Glu Thr Leu Ala
    675             680             685

His Ser Val Asp Ser Leu Glu Gln Leu Thr Gly Ile Arg Met Leu Arg
    690             695             700
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His Leu Thr Met Thr Ile Asp Tyr His Thr Leu Ile Ala Asn Tyr Met
705   710   715   720

Ser Gly Phe Leu Ser Leu Leu Thr Thr Ala Asn Ala Arg Thr Lys Phe
            725   730   735

His Val Leu Lys Met Leu Leu Asn Leu Ser Glu Asn Pro Ala Val Ala
        740   745   750

Lys Lys Leu Phe Ser Ala Lys Ala Leu Ser Ile Phe Val Gly Leu Phe
        755   760   765

Asn Ile Glu Glu Thr Asn Asp Asn Ile Gln Ile Val Ile Lys Met Phe
    770   775   780

Gln Asn Ile Ser Asn Ile Ile Lys Ser Gly Lys Met Ser Leu Ile Asp
785   790   795   800

Asp Asp Phe Ser Leu Glu Pro Leu Ile Ser Ala Phe Arg Glu Phe Glu
            805   810   815

Glu Leu Ala Lys Gln Leu Gln Ala Gln Ile Asp Asn Gln Asn Asp Pro
            820   825   830

Glu Val Gly Gln Gln Ser
        835

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Tyr Xaa Gly Phe Xaa
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